MANAGEMENT AUDIT REPORT

of the

TRANSPORTATION EQUIPMENT COST AND MAINTENANCE SYSTEM (TECAMS)

by

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INTRODUCTION

This is another in a series of audit reports concerning the City's data processing systems. The system addressed herein is under the control of the Bureau of Transportation, and is known as the Transportation Equipment Cost and Maintenance System (TECAMS). TECAMS is an equipment information system intended to provide Bureau of Transportation management with information on equipment inventory, cost and maintenance performance.

The Bureau of Transportation maintains a fleet of approximately 6100 vehicles and equipment for all City departments, other than the Airports, Fire, Harbor, Police, and Water and Power Departments, which have their own maintenance operations. The Bureau does not have full authority over the fleets operated by City departments since equipment operation, fuel utilization and equipment accountability are the direct responsibility of these respective City departments.

Following the assumption of fleet management responsibility for the Department of Recreation and Parks (1967), and the Bureaus of Street Maintenance and Sanitation (1968), the Bureau of Transportation requested the development of a comprehensive management information system to meet the long-term continuing needs of its newly configured organization. The Bureau requested interim improvements in the several existing transportation reporting systems while a more comprehensive system was being developed. These improvements resulted in the first TECAMS system.

SUMMARY

Three separate audits of Bureau of Transportation operations, one by the City Administrative Officer and two by outside consultants, have been conducted in the last three years. Each generally arrived at a similar basic conclusion -- TECAMS does not provide the Bureau of Transportation with information needed to do its job effectively; a new system is needed.

The Bureau has always recognized that TECAMS is only an interim system, since it evolved from several independent information systems used in separate City fleets before they were merged into the Bureau of Transportation. The Director has attempted to gain support for a more comprehensive fleet management information system since that time.

Comparisons with other governmental fleet operations indicate the City is deficient in the implementation of controls for fuel dispensing; equal to others in maintaining records on equipment inventory; and lags with regard to the application of overhead and depreciation factors in fleet cost control.

In the years 1973-75, there was a concentrated effort by a steering committee, composed of independent fleet managers from the Fire and Police Departments, and the Bureau of Transportation, and a representative of the City Administrative Officer, to develop a City-wide Equipment Cost and Maintenance Information System. Bureau management had hoped that a new system would emerge from this effort, but the committee finally disbanded when it was unable to obtain concurrence on a single set of requirements that would satisfy all concerned. Recognizing the committee's lack of success, this audit recommends that the Bureau of Transportation begin establishing design requirements of an overall fleet management information system using the expertise of existing personnel.

Although the 1973 Management Audit Report prepared by the City Administrative Officer specifically stated the Bureau had maintained the City's fleet well, that result was achieved without the assistance of an adequate fleet management information system. The absence of such a system continues to handicap the Director and his staff. Nevertheless, it seems highly desirable that the design of a new fleet management information system proceed at an orderly pace to fully assure the best prospect of a successful effort.

The Bureau's Technical Services Division, with assistance in defining system requirements from the Administrative Services and Fleet Repair Divisions, the Bureau of Accounting, the Data Service Bureau, and various using departments, should be given the responsibility for designing the new system.

Large portions of TECAMS can be incorporated into any new fleet management information system. For instance, the TECAMS Equipment Inventory Subsystem should be continued as is, with some tightening of the procedure used for obtaining up-to-date inventory information from bureaus and departments using Bureau of Transportation equipment. The Equipment Cost Subsystem needs improvement on the application of depreciation and overhead rates. The standard time operations of the Equipment Maintenance Performance Subsystem should be dropped immediately, and the remaining portions of the Equipment Maintenance Performance Subsystem should be dropped if reports cannot be produced within a month after the period ends. Currently, reports are up to six months late.

This report recommends a major reduction of keypunching, printing and distribution of the many TECAMS reports that are not being used by current recipients.

Although not directly the subject of this audit, specific methods are proposed for controlling the City's usage of fuel. In 1974-75, 410,975 gallons of both gasoline and diesel fuel, were consumed and for which there was no accountability. This problem can be traced to inadequate control procedures at fuel sites in receiving fuel and controlling its distribution. The audit report recommends more control at fuel sites and increased departmental and individual accountability.

In conclusion, this report proposes a phased plan to achieve an effective information system for Bureau fleet management. Phase I includes recommendations for immediate implementation after which Phase II recommends definition of the specific requirements for a new system. Phase I calls for dropping the equipment maintenance standards performance subsystem, an improved method for obtaining valid equipment mileage, and the elimination of a great number of reports that are not used by current recipients. Phase II directs the Bureau to initiate the design of a fleet management information system incorporating all those parts of the current TECAMS which are effective; and those modules of management information systems which had been recommended by consultants and which will be of immediate benefit to the Bureau of Transportation (See Exhibit A). The Bureau can accomplish this with its own forces following procedures described in CAO Rule No. 13, Development of Data Processing Systems.

Implementation of the recommendations resulting from this audit should reduce the annual operating cost of TECAMS from $154,000 to approximately $75,000, due to the elimination of the equipment maintenance time standards, improvements in the method of obtaining fuel costs, and a reduction of reports distributed.

RECOMMENDATIONS

(NOTE: The suggested implementation plan involves a time sequence of two separate phases: Phase I - Immediate implementation; Phase II - Future implementation.)

PHASE I

The Director of the Bureau of Transportation:

1. Eliminate the current individualized work measurement program contained in the Equipment Maintenance Performance Subsystem. Drop the remaining portions of the Equipment Maintenance Performance Subsystem if current reports cannot be produced within one month following the close of each accounting period; incorporate an improved maintenance performance system in Phase II planning.

2. Establish TECAMS independent of information on daily fuel sheets through the following changes:

   a. Eliminate the requirement for keypunching odometer readings from the daily fuel sheets. Request each department and bureau using Bureau of Transportation equipment to provide monthly equipment odometer or hour readings.

   b. Provide the Petroleum Products Administrator, Supplies Department, with average miles per gallon and hours per gallon for each class of equipment for use in determining cost of fuel per piece of equipment.

3. Make the following changes to the Equipment Cost Subsystem subject to the review of the Bureau of Accounting:

   a. Drop cost of depreciation when equipment is fully depreciated.

   b. Apply indirect costs based on direct labor.

4. As head of the City agency charged with the maintenance of the City's vehicle fleet inventory, issue detailed instructions and provide examples of completed forms to City Departments and bureaus describing the process for maintaining a current and continuing stock record of the equipment under their control.

5. Poll each recipient of TECAMS reports to determine need requirements and stop the production and distribution of unwanted reports. Notify the Data Service Bureau of the new report distribution requirements.

The City Purchasing Agent (acting through the Petroleum Products Administrator, Supplies Department):

6. Implement the following procedures to control the dispensing of fuel:

   a. Revise the "Daily Record of Fuel and Oil Dispensed Form" to include full last name and department of person receiving fuel products. Provide examples of properly completed fuel sheets to all fuel sites and provide training in filling them out to equipment operators.

   b. Request the Mayor to direct the using department and bureau heads to assume responsibility for fuel dispensing operations where their departments and bureaus are primary users so that proper control and auditing procedures can be established; e.g., the Bureau of Sanitation in charge of the fuel operations at its yards instead of the Bureau of Transportation. Provide training to fuel site personnel on the auditing of fuel sheets.

   c. Request the Data Service Bureau to discontinue the keypunching of data on the "Daily Record of Fuel and Oil Dispensed," when a standard rate of fuel used per class of vehicle is determined.

   d. Request the Bureau of Public Buildings to calibrate the fuel pumps at the Department of Recreation and Parks fuel sites.

The General Manager, Data Service Bureau:

7. Make all reasonable efforts to insure the continued assignment of TECAMS experienced analysts during the period of implementation of the recommendations of this audit report.

PHASE II

The Director of the Bureau of Transportation:

8. Direct the Technical Services Division to determine the requirements for a new TECAMS system. The following items should be considered:

   a. Obtaining user requirements from Administrative Services and Fleet Repair Divisions, the Bureau of Accounting, the Data Service Bureau, and the using departments.

   b. Incorporating those parts of recent consultants' audits concerning TECAMS that will have immediate benefit to the Bureau. (See Exhibit A.)

FINDINGS

Equipment Inventory Subsystem

This subsystem, one of three subsystems in TECAMS, contains data on equipment number, make, model, capacity, locations, City department assignment, responsible driver or supervisor, date of purchase, type of fuel used and initial cost of equipment. The information is updated bi-weekly and several reports are made from the basic input data. One report is generated serially by equipment number, another is sequenced by department and then by equipment class; and yet another departmental report indicates equipment by location. One inventory report is also produced by license plate number.

A major use of inventory reports is to identify the location and department of prime responsibility for the approximate 6,100 items of equipment maintained by the Bureau of Transportation.

Complaints from citizens or inquiries from City officials concerning specific pieces of City equipment are traced to the responsible department by using the equipment number or the license number.

Article 2 of the Administrative Code titled, "Furniture and Equipment Inventories" requires that each City department, for which furniture and equipment has been purchased or assigned, maintain a current and continuing stock record of such furniture and equipment. An annual report is also required to be submitted to the Controller at the end of each fiscal year. The year-end report from the Equipment Inventory Subsystem is submitted to the Controller in compliance with Administrative Code Article 2, Furniture and Equipment Inventories. Some City departments do not maintain up-to-date records on their departmental equipment lists. Personnel of the Administrative Services Section state that some departments do not turn in updated inventories upon request.

Since the Bureau is responsible for centralized transportation equipment maintenance in the City, it should provide specific instructions on how to conduct a transportation equipment inventory which will fully satisfy the Administrative Code Article 2, Furniture and Equipment Inventories. See Recommendation No. 4.

Equipment Cost Subsystem

The Equipment Cost Subsystem provides information on operating, repair and maintenance costs, depreciation, and department indirect costs for each piece of equipment. Operating cost reports are run quarterly. Input data is derived from four major records: (1) Fuel and oil dispensed, (2) Parts costs, (3) Labor cost, and (4) Hour usage or miles driven.

Fuel and oil usage information, as well as equipment hour or mileage data is supplied by operators of equipment located in City departments. This data input is derived on a daily basis from fuel sheets located at fuel pumps.

An interface with the City's parts system, COINS (Coordinated Inventory Control System), provides for parts cost.

Labor cost is derived from a Bi-weekly Timesheet which indicates vehicle number and hours worked for each repair and maintenance employee. An interface with the City's payroll system provides for labor cost.

Depreciation costs are computed over the life of the equipment. There is a problem in the current system in that it continues to show cost of depreciation even though the item of equipment has been fully depreciated.

Indirect cost application is another problem in assessing the validity of cost records in that each piece of equipment carries the same indirect cost regardless of the direct maintenance performed. Indirect costs applied to direct labor would be a more equitable application. The Bureau of Accounting should review the appropriateness of these depreciation and indirect cost applications. See Recommendation No. 3.

On July 1, 1974, responsibility for most fuel and oil products control activity was transferred from the Bureau of Transportation to a new organizational unit formed in the Department of Supplies, the Petroleum Products Administration. This unit is responsible for the control of fuel purchases, fuel inventory, and fuel usage for Council-controlled departments, which consists of approximately 92 pump-fueling sites dispensing about 7,000,000 gallons of fuel per year. The Police, Fire and proprietary departments manage their own fuel programs.

The cost of fuel amounts to approximately 25% to 30% of the total annual cost of vehicle operation according to the Bureau's Fleet Repair and Maintenance Director. The procedures for recording fuel dispensed at these City pump sites is prescribed by the Petroleum Products Administration. A form, "Daily Record of Fuel and Oil Dispensed," is used to record source data of fuel consumed by City equipment. The equipment or vehicle operator enters onto the form the

vehicle number, gallons of fuel dispensed, odometer or hour-meter reading, and his last name or initials.

Cost per mile, equipment mileage, and other equipment usage information in the TECAMS system, is dependent on the computerization of accurate data from the daily fuel form. Lack of control at fuel dispensing sites is resulting in inaccurate data being recorded on the fuel form. The following discussion illustrates this fact.

A Supplemental Audit for Fiscal 1974-75 prepared by J. K. Lasser and Company and Ferguson, Leung and Company, released in February, 1976, revealed that:

> "The consumption of City fuel appears to be loosely controlled. There currently is no accurate way to determine if fuel being dispensed through City pumps is actually used in City vehicles or whether fuel is actually used for City business. The Petroleum Products Administration Division has issued a report regarding fuel usage for Fiscal 1974-75. This report, Staff Report on Fuel Usage and Unaccounted For Fuel for Pump Sites and Using Agencies for Fiscal Year 1974-75, indicates that fuel, both gasoline and diesel, in the amount of 410,975 gallons was consumed for which there was no accountability. This is equivalent to an unaccounted expenditure of City funds of $194,552 ($.50/gal. for gasoline and $.44/gal. for diesel per Department of Supplies personnel). In other words, there's no question the fuel was consumed, however, the City doesn't know how it was used or by whom it was used."

During the course of the TECAMS audit, a general review was made of the petroleum products dispensing operations. Most data entered by hand on the fuel sheets is of doubtful validity. Equipment numbers are improperly filled out or illegible; gas figures are improperly entered, (e.g., 630 gallons instead of 63.0 gallons); some fuel obtained is not entered on the sheets; wrong type of fuel is recorded, and odometer readings are often lower than previous readings. Some vehicles, which were not on the Master Inventory of Vehicles computer file, received fuel, and, therefore, were rejected by the computer and recorded in a "miscellaneous fuel-used" account. These vehicles were not placed into the vehicle inventory file to keep 1976-77 data separate from 1975-76 data in the computer.

Fuel accountability is still a problem. For example during the 12th period of fiscal year 1975-76 over 3,519 gallons of gasoline and 914 gallons of diesel fuel were assigned to the Miscellaneous

Account because its use could not be charged to a City department or employee.

There are some fuel dispensing locations at which management has assumed the responsibility to ensure operations are adequately controlled; fuel dispensing sheets are properly reviewed, balanced against pump meter readings, and legibly prepared. Some notable sites are: West Valley Yard, Street Maintenance; West and East Valley, Bureau of Sanitation; and City Hall, Bureau of Transportation. Methods used at these sites can be used at other fuel sites.

The Assistant Director, Fleet Repairs and Maintenance, Bureau of Transportation, indicates that the mileage and fuel information obtained under the current systems is not valid and cannot be used in the fleet management information system. He states the cost of fuel per vehicle is not needed in his operation; and fuel cost can be adequately approximated from the total mileage driven for the particular vehicle class in a given period of time by projecting standard miles per gallon figures.

During the course of the TECAMS audit, visits were made to the Los Angeles County Mechanical and Road Departments, respectively; Los Angeles Police Department, City of Long Beach and Department of Water and Power fleet operations. These organizations use fuel site control and recording procedures which indicate their fuel dispensing operations are under control. For instance, at the County Road Department the percentage of variance at many fuel sites is under one percent. The administrators at these locations indicated that it is nearly impossible to control fuel without the assistance of full-time attendants during fueling operations.

The County Mechanical Department and the City's Street Maintenance Bureau take monthly mileage readings on their equipment instead of depending on the error prone method of obtaining this information from fuel sheets. This mileage data acquisition technique is recommended for City usage. The Fuel Administrator and Bureau personnel agree that this method will produce greater accuracy than the current method of depending on fuel sheets.

Over the years various mechanical methods have been advocated to control fuel dispensing operations and capture valid data. Some of these systems use precoded plastic cards to control fueling operations and capture exact fuel pump readings per piece of equipment. These mechanical devices are relatively expensive with approximate costs ranging from $8,000 to $25,000 per site.

It is premature to recommend that the City should convert to mechanical dispensing devices or to staff full-time attendants at many of its dispensing sites until it can be determined which particular sites cannot control their operations. A monthly report indicating the amount of fuel which cannot be accounted for should be produced for each site by the Petroleum Products Administration unit and

provided to the Purchasing Agent and the managers of departments/bureaus assigned to control fuel dispensing sites to evaluate the need for corrective action.

The Petroleum Products Administration unit has solved the problem of providing timely payments to the petroleum suppliers. However, the problem of undocumented fuel usage is still significant. It must be curtailed at the dispensing site. Dispensing operations require responsible fuel site managers so that usage sheets are properly filled out, and fuel dispensing operations are under control. All fuel dispensed should on a daily basis balance with the beginning and ending pump meter readings. A complete entry, including the recipient's last name and the date of each transaction, should be recorded on the fuel sheets. The current error report allows no traceability to the department or individual receiving fuel. Departments who are assigned the fuel dispensing operations responsibility should require that pumps be locked and fixed hours of operation established.

Some Bureau personnel were concerned that fuel pumps were not calibrated. A check with the Bureau of Public Buildings indicates that all pumps were calibrated in 1975. The only exception was the pumps located in the Recreation and Parks Department, which should be calibrated at the earliest opportunity.

Monthly reports should be produced to compare the fuel dispensed at each pump site against the difference of the beginning and ending monthly pump meter readings. Fuel sites which experience continuing problems should be identified and corrective action taken.

The procedures indicated above are already in use in similar government operations in the County Road Department, County Mechanical Department, Department of Water and Power, and the Los Angeles Police Department.

In conclusion, the absence of sound fuel consumption records permits an unacceptable level of fuel loss to occur without proper documentation for control purposes. Also, the method of obtaining mileage from the fuel sheets is inaccurate, and, therefore, is not used by Bureau of Transportation personnel. See Recommendation Nos. 2 and 7.

Equipment Maintenance Performance Subsystem

This subsystem produces accounting period and quarterly reports concerning work measurement of equipment maintenance and repair activities. Basic input into the subsystem is from a Work Order document which indicates type of work ordered, repair class, standard time, actual time, equipment number, person doing work, and shop location. Output reports from this subsystem include various performance reports indicating maintenance activity by shop, type of equipment, and actual hours of maintenance compared to pre-determined standard hours of performance.

The portion of the Performance Subsystem which measures actual hours of maintenance compared to predetermined time standards of performance should be dropped for the following reasons: Whereas many fleet maintenance operations cover total time worked, only about one-fourth of all equipment maintenance operations in the bureau are covered by time standards, e.g., 2,380 hours out of 8,000 total hours of maintenance; the current standards in effect cannot be validated because the staff of Methods and Standards Technicians has been reduced from 12 to two in the last five years; and reports are up to six months behind. A "Vehicle Maintenance Report" for the quarter ending in February, 1976, was not run until September, 1976.

Interviews with the Equipment Maintenance Superintendents revealed performance reports have not been distributed to lower shop supervisors for five years because of the faulty information they contain. The reports are so untimely that Bureau Management has indicated they serve no useful operating purpose, and should be eliminated if they cannot be maintained at a proper level. Many of these reports are produced with five copies while three copies would be fully adequate. The recipients of the current reports should be polled with a view to stopping the printing and distribution of unwanted reports. One of the reports contains some 2,000 pages.

The Bureau should consider stopping the duplication of time reporting of maintenance activities now reported on the Bi-Weekly Time Sheet and the Work Order form. Consideration should be given to the employment of a pre-punched daily time card similar to that now being utilized by the County's Mechanical Department. See Recommendation Nos. 1 and 5.

Prior Evaluations of TECAMS

1. Audit by the J.K. Lasser and Company and Ferguson, Leung and Company

In February, 1976, a supplemental audit to the audit of the City for fiscal year 1975-76 was released by the J.K. Lasser and Company and Ferguson, Leung and Company. The audit concerned selected activities in the Departments of Public Works, Recreation and Parks, and Supplies, and also covered evaluation of repair and maintenance of equipment under control of the Bureau of Transportation.

The consultants stated the Bureau had developed some mechanized information systems, but equipment and usage information is not timely and often contains erroneous data.

A suggested comprehensive information system for the Bureau of Transportation Fleet Repairs and Maintenance was included. See Exhibit A.

The Bureau's response in regard to the proposed overall integrated information system was:

> "Generally, the Bureau agrees that the present management information system be modified and improved although some elements of the existing system are basically good and of benefit to operating supervisors. Major concerns lie in the area of recording vehicle utilization in terms of job use, developing an automated replacement program and timely production of automated reports. Present systems provide line supervisors with much of the information that they can logically use in making day-to-day decisions."

2. Audit by the Arthur Andersen and Company, 1975

In April, 1975, Arthur Andersen and Company performed an "operational audit of the Bureau of Transportation." The objective of the study was to suggest improvements that would either decrease expenditures while maintaining existing service levels, or increase service levels at no additional cost.

A concentrated effort was directed to the vehicle maintenance area, where proportionately more money is spent and where there is the greatest potential for significant improvement. One of the major recommendations of the report was: "the Bureau should implement an integrated information system to provide management and supervisory personnel with information necessary to plan, execute, and evaluate the Bureau's activities." (See Exhibit A for suggested system.)

Another notable recommendation of this particular study stated:

> "Detailed work standards should be replaced with measures of team performance based on the operating history of assigned vehicles. Detail work standards apply to only a very small portion of the total work of the Bureau, require constant updating for vehicle purchases and involve repair personnel in excessive paperwork. The Bureau should use overall measures of performance such as the percentage of vehicle downtime, the number of miles between road calls, the number of labor hours per 1,000 miles or hours of operation, the

number of vehicles per mechanic, the number of vehicles per repair employee and the repair cost per vehicle. For each of the measures above, standards are available from the American Public Works Association based on national averages, for various vehicle types."

3. Management Audit by the City Administrative Officer, 1973

In November, 1973, the City Administrative Officer concluded a Management Audit of the Bureau of Transportation. The summary of the audit states: "Bureau management has accepted the challenge in a positive manner as indicated by effective operations in many areas, and the Audit Team was impressed with the enthusiasm and diligence with which the entire force of the Bureau pursues its objectives". It further states the Bureau is doing a good job of maintaining vehicles and service.

The audit goes on to state that a major need of the Bureau is the development and implementation of effective information and control systems in order to facilitate operational capability as well as decision-making.

Information from an improved TECAMS system is vital to a recommended program for the systematic determination of the most economic means of meeting the vehicular needs of various user agencies. In 1973, many of the recommendations for the improvement of TECAMS were turned over to a City-wide steering committee composed of representatives concerned with the development of a City-wide equipment cost and maintenance system.

4. City-wide Equipment Cost and Maintenance System Steering Committee

In April, 1973, the City Administrative Officer appointed a steering committee composed of representatives of directly concerned departments to develop a concept for a fleet management information system that would meet the information needs of all departments. The steering committee was chaired by a representative of the City Administrative Officer and included members from the Police Department, Fire Department, Data Service Bureau, and the Bureau of Transportation. The steering committee reviewed commercial systems on the market and attempted to identify the departmental requirements for the City-wide system. After holding regular periodic meetings, the steering committee was finally disbanded in February, 1975. The reason stated for the disbandment was that individual departmental requirements were so diverse that it was impossible to bring them together in one system. The Bureau is still faced with the problem of operating without an adequate management information system and should proceed to develop one.

New Fleet Information System Requirements

A very important reference concerning Fleet Information Systems is the "Equipment Management Information Systems," Part VI of the Equipment Management Manual, prepared by the American Public Works Association and Public Technology, Inc., May, 1976.

The manual states that the need for and value of local Equipment Management Information Systems is widely recognized. Sufficient, timely and reliable information is essential for sound decision making in areas of equipment management concerning equipment procurement, utilization, maintenance, and replacement.

It further states that no single system will meet the operational and management needs and fit perfectly the organizational structure of all equipment management operations. It is critically important that users of data and generators of data be aware of the reasons for the system and its uses. Effective communication among all parties is vitally needed. Each of those affected should have a hand in the design of the system. The approach will reduce the potential for confusion, misunderstanding and suspicion which may be generated when such a system is implemented.

The reference goes on to state that the data elements necessary for an Equipment Management Information System can be gathered from three basic types of input forms -- equipment inventory forms, repair orders, and fuel tickets. These three types of input documents are extremely powerful data generators and can probably provide 90% or more of the information needed to effectively manage the equipment fleet.

The shop foremen, mechanics and other involved Departmental personnel should be included in developing these basic forms. The users and preparers of input documents are extremely valuable in the design process. They may be better able to spot modifications needed in the forms which administrators might overlook. The attitudes of these individuals toward forms and the information system in general will have a direct impact on the quality of the information obtained.

Since the budget for vehicular equipment is carried in the Bureau of Transportation and the fuel budget in the Department of Supplies, there is little concern on the part of City departments, who are the users of the equipment and fuel, regarding costs of operation. An improved TECAMS will provide the capability for direct charging to using departments for transportation services as currently done in the County of Los Angeles and City of Long Beach.

This audit agrees with the approach to be taken in the design of a fleet management information system as described in the above-mentioned "Equipment Management Manual" and incorporates its concern in Recommendation No. 8. Since the new TECAMS System involves detailed technical knowledge of shop operations and close

communications with shop personnel, the responsibility for the new system design should be placed with the Technical Services Division.

There is a difference of opinion among Bureau management as to which organizational unit should be given the responsibility for the design of the new System. Some feel it should remain in Administrative Services Division, and others feel it should be assigned to the Technical Services Division. This Division is already located at the Transportation Headquarters located at the Seventh Street facility. See Recommendation No. 8.

Data Service Bureau

Bureau of Transportation personnel state that the practice of changing TECAMS analysts in the Data Service Bureau has been detrimental to the improvement of the system. There have been three different analysts assigned to TECAMS in the last three years. More stability is required in this area if expeditious improvements are to be made to TECAMS. See Recommendation No. 8.

System Costs

Estimated Annual Cost of TECAMS (1975-76)

Data Service Bureau	54,000	
Bureau of Transportation	50,000	
Department of Supplies:		
Petroleum Products Administration and Data Service Bureau (Fuel Sheet Processing)	50,000	
		$154,000

Estimated Annual Cost of TECAMS After Phase I Improvements Recommended in this Audit

Data Service Bureau (Reduced keypunching of fuel sheets and elimination of equipment maintenance standard reports)	35,000	
Bureau of Transportation (Elimination of individual equipment maintenance standard reporting)	30,000	
Department of Supplies:		
Petroleum Products Administration and Data Service Bureau (Reduced Fuel Sheet Auditing)	10,000	
		$75,000

NOTE

Phase II costs to develop a new fleet management system will be determined when Phase II design requirements are known.

STATUS OF IMPLEMENTING PAST AUDIT RECOMMENDATIONS
FOR MANAGEMENT INFORMATION SYSTEM

Audit by Arthur Andersen & Co.	J. K. Lasser & Company Ferguson, Leung & Company	Phasing Plan
2) The Bureau should implement an integrated information system to provide management and supervisory personnel with the information necessary to plan, execute and evaluate the Bureau's activities. Major information outputs (see Page II-5) should include:		Phase I - Immediate implementation. Phase II - Follows Phase I implementation.
(a) Responsibility reports, showing budget status and cost variances for parts, labor and expenses, listed by foreman, shop and division.	"b) responsibility reports showing budget status and cost variances for parts, labor, and overhead expenses for various organization units,	Include in Phase II study.
(b) Preventive maintenance schedules and status reports, listed by foreman, shop and division.	c) preventive maintenance scheduling and status reporting by vehicle, h) a shop scheduling system for all repair and maintenance activities,	Include in Phase II study.
(c) Monthly repair status and backlog reports, which depict shop activity by listing vehicles awaiting repair, vehicles being repaired, vehicles being repaired but awaiting parts, and vehicles completed.	d) periodic repair status and backlog reports showing shop activity for vehicles awaiting repair, repairs in-process, repairs in-process but awaiting parts, and completed repairs.	Include in Phase II study.
(d) Shop productivity reports which monitor the performance of repair and maintenance personnel using overall measures of performance such as percentage of vehicle downtime, ratio of vehicles to mechanic, and percentage of emergency repairs.	e) productivity reporting to monitor the performance and effectiveness of various locations and personnel based on overall measures of performance such as downtime, emergency repairs, and repeat repairs,	Phase I - Drop Performance Standards Program. Improve turnaround on performance reports, if not, drop program.
(e) Vehicle inventory reports, listing by equipment number and foreman all vehicles assigned to each repair shop.	a) an equipment inventory system for vehicular equipment, non-vehicular equipment and major repair equipment,	Implemented.

Audit by Arthur Andersen & Co.	J. K. Lasser & Company Ferguson, Leung & Company	Phasing Plan
(f) Operations and maintenance cost reports, listing each vehicle within its vehicle type, showing cost of operations, repairs and maintenance, and analyzing cost by work code and fuel usage data.	f) equipment operations and maintenance costs reports, showing by vehicle and vehicle class, the cost of operating, repairs and maintenance costs, and fuel usage,	Implemented.
(g) Vehicle utilization reports, showing hours used or miles driven, listed by using agency.	i) equipment utilization reporting showing hours and miles used for all types of equipment, including major repair equipment,	Include in Phase II study.
(h) Transfer cost reports, listed by vehicle and using agency.		
(i) Parts supply statistics reports, such as inventory stockouts and turnover by store locations.	k) repair parts inventory statistics showing location, stock-outs, inventory levels and usage.	Currently under study by CAO.
(j) Replacement analyses, which calculate the optimum replacement schedule and determine the status of vehicle procurement and salvage.	j) equipment replacement analysis showing the optimum replacement schedule and status of equipment procurement and salvage activities, and	Include in Phase II study.
(k) Personnel data reports, listed by employee and shop, detailing attendance, vacation and overtime."		Implemented.
	g) standardization and codification of repair and maintenance operations and analysis reporting by type of work, shop location, and personnel."	Implemented.